



Serial No. 09/782,270

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REMARKS

This is in response to the office action of November 6, 2002. In this amendment, claims 1, 5 and 9 have been amended. The remainder of the claims remain unchanged.

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The Rejections

The Examiner has rejected claims 5, 9 and 10 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Claim 5 has been amended so as to define a "contacting passage", and claim 9 has been corrected to depend on claim 8. In view of these changes, withdrawal of the rejection under 35 U.S.C. 112, second paragraph, is requested.

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The Examiner has rejected claims 1 to 4 and 12 under 35 U.S.C. 102(e) as being anticipated by Martin. Reasons for this rejection are provided in paragraph 5, starting on 2 page of the office action. The Applicant will traverse this rejection, for the reasons set out below.

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It is also noted that claims 13 and 14 have been allowed. Further, the Examiner has found that claims 5 to 11 contain allowable subject matter, and would either be allowable if

rewritten in independent form, or depend from an allowable claim, as appropriate.

As such, the claims presently in issue are claims 1 to 4 and 12, rejected for the reasons set forth above. Applicant will therefore discuss these claims and the reference relied upon in rejecting them in some detail below in an effort to persuade the Examiner that Martin lacks the necessary disclosure and teachings which anticipate, or even make obvious, the claims under rejection.

Claim 1

The essential elements and features recited in independent claim 1 can be summarized as follows:

a water treatment apparatus for treating water in a device, the apparatus comprising:

(a) an extractor line which removes water from the device;

(b) an ozone generator which produces ozone and conveys a supply thereof;

(c) a contactor/mixer member which has an entry passage and a contacting passage. The entry passage receives water from the extractor line and ozone from the ozone generator which are passed through the contacting passage. In the contacting passage, a mixture of water and ozone are processed. Specifically, the

claim states that the contacting passage is "configured so as to create turbulence to intimately mix the water and ozone"; and

(d) a return line receives and transports the water and ozone mixture from the contacting passage back to the device.

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Claims 2 to 4 and 12 recite additional inventive and novel features. These, of course, depend from independent claim 1, which, as will be argued below, defines patentable subject matter.

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At this point, Applicant wishes to emphasize the recital in the claim that the contacting passage is configured so as to create turbulence and intimately mix the water and ozone. This is a most important feature of the invention, which is absent in Martin. While the present invention mixes the ozone in the water treatment apparatus itself so as to treat the water in the water treatment apparatus, Martin merely injects ozone into the water which then passes into the spa.

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20 Martin

Martin discloses an apparatus for purifying spas. This patent teaches a spa 50 with water 52. The water 52 is drawn out through outlet 54 into the conduit 56. The water then passes into piping segment 70, and a small portion thereof, as determined by

valve 78, flows through bypass line 72. The bypass line 72 is also supplied with ozone from an ozone generator 12 through conduit 80. Ozone is drawn into the flowing water through a venturi assembly 74, and then passes back into the spa 50 through
5 return lines 64 and 66.

At column 2, lines 43-46, the following is stated:

"Any suitable transfer assembly may be utilized provided that it functions to cooperate with the ozone generator to
10 pass ozone produced by the ozone generator to the water in the spa or jetted tub".

This statement makes clear that the purpose of introducing ozone into the transfer assembly 14 in Martin is to get the ozone
15 into the spa itself. This is also clear from the disclosure at column 2, lines 13 to 15 which states that "transfer assembly cooperates with the ozone generator to pass ozone produced by the ozone generator to the water *in the spa or jetted tub*" (emphasis added). Therefore, the Martin apparatus can be seen as one
20 whereby controlled amounts of ozone are passed into the spa for action in the spa, whereby the ozone is present in the spa in concentrations sufficient to purify or sanitize the water in the spa.

Martin makes absolutely no effort whatsoever to create the turbulence to intimately mix the water and ozone in the bypass line 72. In fact, Martin does not have any reason for creating this mixture, since the purpose of the bypass line is merely to place ozone in the return line for action in the spa. The elbows in the bypass line 72 are for plumbing purposes only. They merely form a shape which returns the bypassed water to the main conduit 56. While the elbows shown in Figure 1 happen to be at right angles to each other (and there are two of them), this is just the simplest way of returning the bypassed water to the main line and, as mentioned above, there need not even be these elbows since all that is required is cooperation which will have the effect of passing ozone to the water in the spa.

In summary, therefore, Martin discloses an apparatus which introduces ozone into a stream of water, but makes absolutely no effort to create turbulence and mix the ozone, since this action is not, in fact, necessary for the purposes of achieving the objectives of the invention.

This is very different from the present invention, as claimed, and a comparative discussion to highlight the importance of these differences will now follow.

Comparison of Claimed Invention and Martin

The claimed water treatment apparatus is, as the name implies, the apparatus in which the water is treated. This can immediately be contrasted with Martin, in which the bypass line 72 is not one in which the water is treated. It is simply the mode by which ozone is introduced into the water to get it to the spa. Thus, conceptually, there is at the outset a clear distinction between the present invention and Martin: the present invention actually treats the water in the water treatment apparatus, while Martin treats the water in the spa, and uses the bypass line merely to get the ozone into the water.

As a consequence of the above, due to the turbulence and intimate mixing of the water and ozone within the water treatment apparatus (as opposed to the device using water) in the present invention, intimate mixing occurs in the pipes where the ozone and water are flowing. This intimate mixing is, of course, the result of turbulence caused by the configuration of the passage (bends, turns, changes of direction, etc.). This is made clear in the specification as filed, and the Examiner is referred, for example, to the disclosure at page 7, line 16 to page 8, line 2. Please also see page 9, lines 10 to 22. Herein it is stated that the water is treated in the confined spaces of the piping where bacteria, particles and dissolved chemicals are in contact with

the ozone gas phase, as well as the dissolved phase. The ozone gas phase is much more potent as a disinfectant, allowing relatively low ozone levels to do the job more effectively. This would not be possible in, for example, Martin, where the ozone in the spa would be in its dissolved phase. Martin shows no technique or apparatus for agitating the water and ozone mixture to keep the ozone in the gaseous phase for increased effect.

As a matter of fact, Martin represents a perfect example of the prior art as described in the filed application, at page 9, line 24, to page 10, line 13. Whereas the invention causes most of the disinfection in the pipes, this is in contrast to other systems, such as Martin, where the water and ozone are conveyed to the tower, or spa, for disinfection.

Another important reason for keeping high concentrations of ozone out of the spa or tower, as is the case with a water treatment apparatus of the invention, is to reduce the corrosive effect which high concentrations of ozone within a system can produce.

It will be apparent from the above discussion that Martin merely introduces ozone into a water stream which returns to the spa, where the ozone is intended to have its effect. The water

treatment apparatus of the present invention actually has the disinfectant produce results within the apparatus itself, rather than in the main body of water. Thus, Martin merely describes a way to get water to the spa, with no attempt to encourage
5 dissolving ozone in the water, or extend contact time between dissolved and gaseous ozone. Martin does not define a mixer or contactor of any type. As mentioned, the elbows or pipe connectors used in Martin are simple plumbing components which may vary by installation. There is no series of passages
10 configured, such as by a plurality of vertical and horizontal components, a helical effect, or other such structure, as is the case in the present invention, which causes mixing.

In contrast, the present invention does all or at
15 significant amount of the work of mixing and disinfection in the mixer pipes or contacting passage, which is not simply a transfer system to get the ozone to the sump.

Martin obtains its effect by building up a residual of ozone
20 within the spa. In contrast, the present invention attempts to use the ozone such that no significant residual will build up in the sump (or a corresponding spa), a distinct advantage of the inventive apparatus.

In specific embodiments of the invention, the contacting passage has vertical components with shorter horizontal connections to create alternating flow-counter-flow conditions for the gas bubbles in the vertical components to encourage solution and mixing. In contrast, Martin shows piping where the greatest length is in the horizontal pipe. To effect any mixing in a horizontal pipe is more difficult, and it is likely that in such horizontal pipes the gas and water will separate into a top layer of gas and a bottom layer of water, so that no mixing will occur at all. This is in stark contrast to the presently claimed invention where intimate mixing, as a result of turbulence, is a central theme of the invention.

As further points of distinction, Martin neither suggests, teaches or even hints at the possibility of helical shear components to provide a torque or twist to the shear across the elbows.

In one embodiment, the contactor/mixer of the invention is designed to have an extended (65 feet and longer) pipe length for the ozone to do its work. This ensures the longest possible contacting time in the greatest length of pipe. The system of the invention is designed to keep the water and gas mixing and contacting through these lengths of pipe, since it is here that

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the ozone does the disinfection and chemical work, as opposed to in the spa of the Martin patent.

Conclusions

5 For the detailed reasons set forth above, it will be appreciated that Martin represents a typical prior art system which the present invention endeavors to improve upon in many ways, as discussed.

10 Favorable reconsideration, and allowance, of claims 1 to 4 and 12 is therefore respectfully requested. If the Examiner has any comments or questions, she is invited to contact the undersigned at (818)710-2788.

15 Please confirm receipt hereof by stamping and returning the enclosed postcard.

Respectfully submitted,

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25 Colin P. Abrahams (Reg. 332,393)
5850 Canoga Avenue, Suite 400
Woodland Hills, CA 91367
Tel(818)710-2788 Fax(818)710-2798

30 Enclosed: Petition for Extension

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